1 6 1992

OU III RI/FS PLANS
COMMENT RESPONSE SHEETS

GENERAL COMMENTS

EPA and the State believe that two of the main goals of this phase of the work should be to define the extent of contamination and to determine the potential for contaminants to migrate to the Burro Canyon aquifer. This migration may be inhibited by the Mancos Shale (when present) and the Dakota Sandstone. Any ground water remediation project and future water resource development would be affected by the limiting properties. Ideally, the characterization of the Mancos Shale and Dakota Sandstone should include determination of vertical hydraulic conductivity and vertical hydraulic gradient, and a determination of whether vertical migration pathways exist, such as fracturing or improperly abandoned wells. An estimate of the characteristics should be made for the entire area underlying the contaminant plume.

The State is also concerned that in several places in the RI/FS documents it is inferred that ground water not currently developed for use as a drinking water supply, such as small isolated aquifers in the Dakota or Burro Canyon aquifer downgradient of the site, would not be protected under the Utah Ground Water Protection Regulations. It is the intent of the regulations, however, to protect existing and probably future beneficial uses of all ground waters in the State.

COMMENT 1

The Work Plan proposes a network of monitoring wells in the shallow alluvial aquifer to; establish background water quality, and evaluate contamination upgradient, downgradient, and on the site. In the downgradient direction five wells are proposed, all within 300 feet of Montezuma Creek. While these wells may be adequate for the first stage of the investigation, we question whether the well network site is sufficient to define the full extent of the contaminant plume. The belt of alluvium downgradient from the millsite is about 1500 feet wide, and the proposed well network does not cover areas away from the creek.

RESPONSE:

Boreholes will be drilled in a north and south direction from the center of the pre-millsite alignment of Montezuma Creek to assess the width of the alluvial aquifer. These boreholes will be drilled east of the East Tailings Pile in three transect lines located near well 84-74 and proposed wells 92-08 and 92-09. It is expected that two or three borings in a north and south direction will be required to estimate the width of the alluvial aquifer. Continuous split-spoon sampling will be used to collect subsurface samples and some of the boreholes (approximately 9) will be completed as piezometers.

See Work Plan, P. 7-6, Section 7.3.9; "To estimate the width of the alluvial aquifer, 18 soil borings will be drilled in three transect lines."

An additional alluvial well will be constructed in the "pre-millsite" Montezuma Creek Channel which will be located through the borehole drilling program described in the above paragraph. This well will be constructed in a manner that allows for collection of water quality samples.

See Work Plan, P. 7-6, Section 7.3.9; "One of these wells will be constructed in the historic stream channel just east of the millsite."

See Field Sampling Plan, P. 4-3, Section 4.1.3; was revised to include "... The first boring location along each transect will occur near the stream channel or inferred historic stream channel. Subsequent boring locations will be decided in the field considering the depth of alluvium at borings drilled and the horizontal distance to exposed bedrock".

Additional characterization of the alluvial aquifer beyond that proposed as part of this Phase I investigation, will be conducted as part of a later phase. Further characterization is partially dependent on the results of the Phase I investigation.

COMMENT 2

EPA and the State are concerned that the limited number of wells (presently seven are proposed for construction) will not provide downgradient monitoring of the upper strata of the Dakota Sandstone since DOE has stated in other documents that tritium testing on the far-South site indicates a possibility that the Mancos Shale and Dakota Sandstone are in hydraulic communication. Another concern shared by EPA and the State is that the Mancos Shale is missing from the geologic sequence several hundred yards east of the Millsite, the result being that the alluvial aquifer is in direct contact with the Dakota Sandstone.

The Work Plan proposes to install monitoring wells in the Dakota Sandstone at three (3) upgradient locations and one (1) downgradient location if water-bearing units are encountered in the Dakota during installation of Burro Canyon wells. Section 6.1.3 states that the Dakota Sandstone is a saturated unit and the criteria that will be used in determining if water-producing zones are present should be provided. The Dakota Sandstone is over 80 feet thick on portions of the site and a contingency plan to protect water-bearing zones should be provided. It is recommended that monitoring wells should be completed and screened in the Dakota Sandstone to adequately characterize the contamination and hydraulics of the strata. Quantification of these properties are important in ensuring

protection of the Burro Canyon Aquifer, a potable water resource. Alternate locations for Dakota Sandstone wells must be provided in the event water-producing zones are not encountered during installation of the Burro Canyon wells.

Section 6.1.7 indicates that on-site Dakota Sandstone wells may be installed after relocation of the tailings piles in order to minimize the potential for contamination of the Dakota. Removal of source materials during the remediation of OU I will take several years, and it will be necessary to install on-site wells to monitor throughout this time in order to avoid possible data gaps. On-site wells screened entirely in the Dakota would provide early warning of possible impacts to the underlying Burro Canyon aquifer. On-site wells would also provide the most accurate information on the hydraulic properties of the confining layer beneath the source area. Well installation and construction methods, such as those proposed for bedrock wells in the Work Plan (i.e., use of an upper casing and telescopic drilling procedures), could be used to install these wells while minimizing the potential for contaminating the Dakota Sandstone and lower formations with alluvial ground water.

RESPONSE:

An additional well will be installed just east of the East Tailings Pile, near the additional alluvial well discussed under comment 1 and also in the approximate center of the alluvium associated with the pre-millsite alignment of Montezuma Creek exists. This well will be screened across the water bearing zone assumed to be the lower sandstone member of the Dakota Sandstone, if present. Boreholes will be drilled near the east side of the East Tailings Pile to determine the extent of the alluvium in a north-south direction to facilitate location of this well. This well will be constructed in a manner that also allows for collection of water-quality samples and testing of the possible "interconnectiveness" between the Dakota Sandstone and alluvial aquifer.

See Work Plan, P. 6-5, Section 6.1.11; "One well should be installed in the old stream channel as near as possible to the eastern boundary of the millsite and in close proximity to an existing Dakota Sandstone/Burro Canyon monitoring well."

Existing core taken from the Millsite and disposal site will be studied to evaluate the stratigraphy of the Dakota Sandstone. This will help to develop an understanding of the function of this formation as both an aquitard and water producing system. The core is expected to be available for inspection mid to late July.

Additional characterization of the Dakota Sandstone, beyond that proposed as part of this Phase I investigation, will be conducted as part of a later phase. Further characterization is partially dependent on the results of the Phase I investigation (Phase I results will be used in scoping additional investigations).

COMMENT 3

EPA and the State believe that additional monitoring wells in the Burro Canyon Formation are necessary to monitor water quality. Doe is proposing to monitor impacts on the Burro Canyon aquifer based solely on off-site monitoring. An additional well completed in the Burro Canyon is proposed, but this well is located nearly 4000 feet downgradient of the site. Two wells located closer to the site (83-70 and 84-74) will also be sampled, but these wells are screened in both the lower Dakota Sandstone and the Burro Canyon Formations. Since the Burro Canyon aquifer is a potable water supply, it would seem prudent to install additional well(s) between existing and proposed downgradient Burro Canyon wells. An area located approximately 600 feet east of the Millsite that is thought to contain two porous and permeable zones (see Section 3.4.3, paragraph 2) should be included. This would aid DOE in confirming or rejecting the notion that the Burro Canyon aquifer is not be impacted by the millsite. Installation of additional wells would also help to evaluate the impact of pumping wells would also help to evaluate the impact of pumping wells on the direction and rate of groundwater flow in the Burro Canyon Aquifer, an identified data need in Section 5.2.3.3. Monitoring of the on-site Dakota Sandstone wells (comment 2) could serve as an indicator for whether the construction of additional on-site Burro Canyon wells may be necessary.

RESPONSE:

Installation of additional wells beyond those already proposed in the Phase I Work Plan in the Burro Canyon Aquifer is not required to meet the objectives of Phase I. The additional Dakota well identified under Comment 1 will be in close proximity to an existing Dakota/Burro Canyon well. Testing of both of these wells will provide information on whether or not the water producing member of the Dakota Sandstone is unique from the Burro Canyon Aquifer. If these systems function as essentially one hydrogeologic unit, then the existing Dakota/Burro Canyon wells are adequate to assess contaminant migration in the Dakota/Burro Canyon aquifer system.

See Work Plan, P. 6-5, Section 6.1.11; "Water quality analytical results will provide information on whether or not Dakota Sandstone water is unique from the Burro Canyon aquifer ".

See Field Sampling Plan, P. 5-12, Section 5.6 AQUIFER TESTS; An additional section was added to the Field Sampling Plan describing the aquifer tests.

COMMENT 4

The Work Plan should present at least some general discussion on what will be done if contaminants are detected in a downgradient well. For example, if contaminants are detected in the proposed Burro

Canyon well 92-09 located east of the millsite, will additional wells be installed further downgradient and/or in deeper aquifer zones in order to characterize the extent of contamination? DOE should acknowledge this possibility and propose contingencies for future sampling phases.

RESPONSE

The OU III schedule shows a commitment to have the revised RI/FS Work Plan drafted by July 1993. This plan will be based on the results of two sampling events from the Phase I investigation. The revision to the Work Plan will identify additional characterization that may be required to assess the extent of ground-water contamination from the Millsite in addition to other characterization activities that may be necessary to support the preparation of a risk assessment and development of remedial action alternatives.

See Work Plan, P. 6-1, Section 6.0; "Tasks identified at a later date may include additional well installation for hydraulic parameter estimation or for sample collection and analysis to further define extent of contamination."

COMMENT 5

The Work Plan must specify the data quality objectives, (DQOs) identify the existing data gaps, and describe the work that will occur at OU III that will provide the data and analyses necessary. EPA and the State believe that essential to the determination of an appropriate remedy selection for OU III is an understanding of the hydraulic relationships between the different hydrologic units as well as a more accurate depiction of the existing contaminant plume. The present RI/FS Work Plan will not provide the necessary information.

RESPONSE

The objective of the Work Plan is to characterize baseline surface-water and ground-water conditions as part of OU III. The data quality objectives (DQOs) as currently stated for the Phase I characterization activities are adequate. DQOs for future phases will address data requirements for further characterization and/or remedy selection. Data quality objectives are stated in Section 3.1 of the Field Sampling Plan.

COMMENT 6

DOE has not referenced appropriate EPA guidance documents: Handbook of Suggested Practices for the Installation of Ground Water Monitoring Wells, EPA/600/4-89/034, March 1991. DOE needs to revise the Work Plan and the Field Sampling Plan taking into consideration and incorporating guidance provided in this document. DOE should also be aware that Chapter 11 of SW-846, (Ground Water Monitoring) is

being revised and although not yet finalized should provide additional guidance. A third reference is the RCRA Ground-Water Monitoring Technical Enforcement Document. USEPA:OSWER-9950.1 1986.

RESPONSE

Field Sampling Plan, P. 5-1, Section 5.0; was revised to read "This section is intended to provide guidance to field personnel on the detailed procedures to be used for the construction and development of monitoring wells and collection of water samples and data in the field. All field tasks will be performed according to the procedures listed in Appendix A and Geotech's *Environmental Procedures Catalog* (Chem-Nuclear Geotech 1992c). The *Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells* (EPA 1991) and *RCRA Ground-Water Monitoring Technical Enforcement Document* (EPA 1986) will be used as guidance for the tasks associated with ground-water well design, installation, and development. Specific portions of these procedures are discussed in more detail in the following text".

COMMENT 7

DOE needs to include,in the RI/FS Work Plan, data on the design and construction of existing wells which are proposed to be used in the monitoring program for Operable Unit III, including the steps which have been taken to maintain the integrity of each well.

RESPONSE

A table has been provided in Appendix B of the Work Plan on some aspects of the well completions. Additional detail on previously installed wells (prior to 1992) will be provided in March 1993; additional detail on wells completed during 1992 will be included in the Phase I investigation report. The integrity of the wells will be evaluated by assessing existing water-quality data in addition to the monthly inspections.

COMMENT 8

DOE needs to be specific as to the Health and Safety Plan (H+SP) which will govern at OU III. DOE presently has in place a Health and Safety Plan for Vicinity Properties and one for the Millsite. Will DOE be preparing a specific H+SP for OU-III or will DOE be preparing task specific H+SP for OU-III or will DOE be preparing task specific H+Sps? If task specific, which programmatic H+SP will DOE use? This must be clarified in both the CERCLA Management Plan and the Surface- and Ground-Water Remedial Investigation Feasibility Study Documents.

RESPONSE

A separate Health and Safety Plan specific to the OU III RI/FS investigation has been prepared and has been submitted with the other OU III RI/FS documents.

COMMENT 9

DOE needs to make certain that the proposed surface- and ground-water monitoring program is compatible with any future characterization of the terrestrial and aquatic Ecosystems. We have included several EPA ECO Update Bulletins for your information. These should be of assistance during preparation of the work plan.

RESPONSE

These characterization activities will be included in the next phase of activities.

COMMENT 10

Throughout the Work Plan nitrate is listed as one of the constituents found in surface water and alluvial ground water and is incorrectly designated as NO_4. NO_3 is the correct nomenclature for nitrate.

RESPONSE

See Work Plan, P. 4-2, Section 4.1.2; "A review of the analytical result to date, . . . , shows that concentrations of . . . nitrate (NO_3), Se, and uranium (U) have exceeded the standards in more that one ground-water samples."

Revisions were also made in Sections 4.2.2 and 5.1.

WORK PLAN - Specific Comments

COMMENT 1

P. 3-4, Section 3.3.3; The discussion of the thinning of the Dakota Sandstone to the East of the Millsite is somewhat misleading. The Dakota Sandstone is unconformable over the Burro Canyon Formation. The thinning of the Dakota downgradient may also be a result of non-deposition.

RESPONSE

See Work Plan, P. 3-4, Section 3.3.3; "The Dakota Sandstone near Monticello is approximately 100 ft thick; however, in parts of the project area, the Dakota has a reduced thickness either due to non-

deposition or erosion during the downcutting of the Montezuma Creek Valley."

COMMENT 2

P. 3.4, Section 3.3.4; The thin beds of white bentonite may or may not be present. If they were exposed most probably they have been eroded away.

RESPONSE

See Work Plan, P. 3-4, Section 3.3.4; "Several thin beds of white bentonite also occur in the lower Mancos but are either simply not present in the exposed horizons or not present because they have eroded away."

COMMENT 3

P. 3-5, Section 3.4 HYDROLOGIC SETTING; Although the Mancos Shale and Dakota Sandstone are alleged to act as aquitards, retarding flow between the alluvial gravel and the Burro Canyon. EPA and the State remain concerned that in the Montezuma Creek Valley there may be significant hydraulic communication between the hydro-geologic units. A principal objective of the remedial investigation is to determine if the hydraulic communication is significant.

RESPONSE

Pumping tests in addition to slug tests will be conducted as part of the Phase I OU III RI/FS investigation. Details on the method to be used to conduct these tests and wells to be used for testing will be identified in the Field Sampling Plan.

See Work Plan, P. 7-7, Section 7.3.10; "Slug tests (and pumping tests if slug test data indicate a good water-producing unit) will be performed on the new monitoring wells to estimate the hydraulic parameters for ground-water flow and contaminant-transport modeling."

Also, see Section 7.3.11 of the Work Plan and Section 5.6 of the Field Sampling Plan.

COMMENT 4

P. 3-5, Section 3.4; EPA and the State would like to see the hydraulic parameters (i.e., depth to water, pump test data, flow direction, etc.) determined for each of the geologic units in order to completely define the relationships between aquifers and regional vs. local flow patterns.

RESPONSE

This information will be collected within the scope of the Phase I investigation and will be included in the Phase I summary report. Additional data may be required as part of the Phase II investigation requiring the installation of additional wells.

COMMENT 5

P. 4-2, Section 4.1.2; It might be useful to indicate in a table those constituents which were analyzed for and whether or not there were hits above standard.

RESPONSE

This information will be provided in November 1992, contingent on receiving the analytical data in September.

COMMENT 6

P. 4-6, Section 4.2.2, paragraph 2; This seems to contradict the statement on page 3.5 where it is indicated that Montezuma Creek was realigned to the South and a channel established on the Dakota Sandstone. Is there or isn't there alluvium under the existing channel? Perhaps what is disconcerting to EPA and the State is that there is evidence of contamination in the Dakota Sandstone and there is no effort identified in the existing Work Plan to determine the extent of contamination in the Dakota.

RESPONSE

See response to general comments 1 and 2. Depending on location, Montezuma Creek flows directly over either alluvium or Dakota Sandstone (in the vicinity of the East Tailings pile, Montezuma Creek flows over Dakota Sandstone). The following sentence was removed from Section 4.2.2; "Because the alluvial aquifer is in direct contact with Dakota Sandstone, most of the wells showed elevated concentrations of the constituents as were elevated in the alluvial aquifer but at much lower levels."

COMMENT 7

P. 4-6, Section 4.2.2; Additional discussion of the contribution to the contaminant load from the abandoned wastewater treatment plant and the golf course should be added here.

RESPONSE

Section 4.2.2 discusses the water quality of the Mancos Shale and Dakota Sandstone as defined by previous investigations. Discussion on the contaminant load from the abandoned wastewater treatment plant

and golf course and the objective of this characterization are included in Sections 5.1 and 6.1 of the Work Plan, respectively.

P. 5-1, Section 5.1; "Other possible sources of contaminants in the project area include the Monticello Municipal Golf Course and the abandoned sewage disposal plant, both located west and upgradient of the millsite (west of U.S. Highway 191). These facilities may have contributed nitrate and metals to the ground-water and surface-water systems."

P. 6-1, Section 6.1.1; Because the Monticello Municipal Golf Course and the abandoned sewage plant may contribute nitrate and nitrate and metals, respectively, to surface water, an additional sampling location is needed downstream of the sewage disposal plant (between the sewage disposal plant and the millsite) to provide information on the quality of surface water entering the site."

COMMENT 8

P. 4.6, Section 4.2.2, last paragraph; We do not believe that the data presented to date supports the contention that the Dakota Sandstone is an effective aquitard in the tailings area, preventing the Burro Canyon aquifer from being significantly recharged with contaminated water. The extent of the hydraulic communication between these aquifers still needs to be determined. There could be a highly contaminated slug of water migrating through the Dakota. DOE has not developed any wells in the upper or middle Dakota which can support DOEs contention.

RESPONSE

See response to general comments 1 and 2 and specific comment 3.

COMMENT 9

P. 4-7, Section 4.3.1, paragraph 4; It is stated that since the tritium content of Burro Canyon ground water near the millsite is below detection limits, it is inferred that little or no recharge of the Burro Canyon has occurred and that the Dakota Sandstone effectively acts as an aquitard. Quantification of this assertion is necessary (through aquifer testing) in order to achieve a reasonable degree of confidence regarding the potential for contamination to the Burro Canyon Aquifer. In addition, the potential for recharge to the Burro Canyon east (downgradient) of the millsite where the Dakota Sandstone has been eroded away needs to be investigated.

RESPONSE

See response to specific comment 3 and 4.

COMMENT 10

P. 4-7, Section 4.3.1, paragraph 2; Based on the information provided in this paragraph the aquifer pumping test is inconclusive. Several potential problems of the pump test include: the screened intervals included both Dakota and Burro; isolated zones within each formation were not used as observation wells; the observation well was more than 500 feet away; and the open holes may have been receiving water from other strata. Document(s) containing information on the aquifer pump test performed on the Burro Canyon aquifer should be referenced.

RESPONSE

Information on the aquifer pumping test is contained in Section 4.3 of the *Final Remedial Investigation/Feasibility Study - Environmental Assessment for the Monticello, Utah, Uranium Mill Tailings Site.* Additional data requested under specific comments 3 and 4 will clarify the hydraulic characteristics of the system.

COMMENT 11

P. 4-7, Section 4.3.2, paragraph 1; EPA and the State believe that concern for the water quality in the Burro Canyon warrants continued scrutiny. Based on DOEs own estimates of travel time through the Mancos Shale and the Dakota Sandstone it is doubtful that contamination for the Burro Canyon would have occurred by this time.

RESPONSE

See response to general comment 3.

COMMENT 12

P. 4-7, Section 4.3.2, paragraph 2; A discussion of well abandonment is required here. DOE should include the procedures and/or reference the documents which were developed for the Abandonment of the Millsite wells.

RESPONSE

An additional section (5.7, WELL ABANDONMENT) was added to the Field Sampling Plan and a copy of the State of Utah water well regulations is presented in Appendix B.

Field Sampling Plan, P. 5-14, Section 5.7; additional text was added to read "Proper well abandonment will prevent vertical movement of ground-water within the borehole as well as preventing the annular space surrounding the well casing from becoming a conduit for possible contamination of the ground-water supply. Boreholes and monitoring wells abandoned in conjunction to OU III will be in compliance with the State of

Utah,"Administrative Rules for Water Well Drillers" (Appendix B). Well abandonment will also follow Geotech Procedure LQ-13(P), "Standard Practice for Borehole and Monitoring Well Abandonment" (Appendix A).

Abandonment of the soil borings will occur by grouting the borehole to the surface to prevent contamination of the alluvial aquifer and/or Burro Canyon aquifer."

COMMENT 13

P. 4-12, Section 4.4., paragraph 1; This is a significant data gap which DOE has recognized, The existing upgradient wells do not provide background water quality.

RESPONSE

No response required.

COMMENT 14

P. 4-12, Section 4.4, paragraph 3; It would appear that an equilibrium between alpha an beta decay should have occurred by this time. Does a high beta decay indicate something that we should consider further (i.e., does it have something to do with the radioactivity contributed from the underlying sediments vs. the spoils). It seems apparent from the information provided, that the alluvial channel which was partially excavated on the Millsite to locate the East Tailings pile has been significantly contaminated by discharge from the tailings piles. DOE needs to investigate in detail the alluvial channel. In particular the alluvial channel appears to be in direct contact with the Dakota Sandstone and may be incised into the Burro Canyon east of the Millsite.

RESPONSE

See response to general comment 1. No further response required.

COMMENT 15

P. 4-13, Section 4.4; What are the consequences to cleanup goals (ARARs) if there is a higher than acceptable contribution of U (or other contaminants) from the natural system? Also, throughout the document no effort is made to separate stable U from unstable isotopes of U. Is one more dangerous from a health standpoint than the other?

RESPONSE

Cleanup goals will be addressed as part of the development of DQOs for later investigation phases. As part of this investigation, U-234

and U-238 will be characterized to allow for assessment of risk for each isotope, if appropriate.

COMMENT 16

P. 5-1, Section 5.1, Paragraph 1; Elsewhere it has been indicated that contamination of the Burro Canyon aquifer is unlikely. Please reconcile these statements. Explain how the addition of a single down-gradient (3500 + feet) Burro Canyon well will support DOEs contention that contamination has not reached the Burro Canyon.

RESPONSE

See response to general comments 2 and 3. Work Plan, P. 5-1, Section 5.1; text has been revised to include "...The low concentrations of radiologic constituents are thought to be naturally occurring."

COMMENT 17

P. 5-3, Section 5.2.3.1; paragraph 1; Is the unconfined aquifer mentioned herein referring to the Alluvial aquifer?

RESPONSE

The unconfined aquifer referenced is the alluvial aquifer. Work Plan, P.5-3, Section 5.2.3.1; Text has been revised to state "Additionally, some zones of the alluvial aquifer are in direct contact with the tailings piles."

COMMENT 18

P. 5-3, Section 5.2.3.1; paragraph 4; It will be necessary to get a handle on the hydraulic relationships between the different geologic units. The vertical migration must be understood. Factors such as improperly abandoned wells, tunnels, adits and fracture zones may provide preferential pathways. Possible season variation must be considered so this should be a long term (1 yr) investigation.

RESPONSE

See response to specific comments 3 and 4.

COMMENT 19

P. 5-3, Section 5.2.3.2; This data gap is precisely why DOE needs to conduct immediate characterization of the Dakota Sandstone to determine its relationship with the other geologic units present.

RESPONSE

No response required.

COMMENT 20

P. 5-4, Section 5.2.3.3, paragraph 4: DOE suggests that passible contamination should be investigated. Will it be investigated? What is being proposed as part of this Work Plan?

RESPONSE

This section addresses the conceptual model. The next section of the Work Plan addresses the commitment to conduct the investigations.

COMMENT 21

P. 5-4, Section 5.2.3.3; The text incorrectly states that location of municipal supply and private wells within 0.5 mile of the millsite are shown in Plate 4-1. This information is provided in Plate 5-1. The table of contents also needs to be corrected accordingly.

RESPONSE

Work Plan, P. 5-4, Section 5.2.3.3; Text has been revised to state "The locations of municipal supply and private wells within 0.5 mile of the millsite are shown in Plate 5-1."

COMMENT 22

P. 6-1, Section 6.1.1; Is the statement correct that "an additional sampling location is needed downstream"? Is the location between the golf course and the millsite? Please explain.

RESPONSE

The location is between the treatment plant and the millsite. Work Plan, P. 6-1, Section 6.1.1; "... an additional sampling location is needed downstream of the sewage disposal plant (between the sewage disposal plant and the millsite ...".

COMMENT 23

P. 6-1 and 2, Section 6.1.2; Is there a value in separating the two potential sources of nitrates so that there individual nitrate contributions can be assessed?

RESPONSE

DOE feels that there is value in assessing the nitrate sources of the golf course and sewage treatment plant.

COMMENT 24

P. 6-2, Section 6.1.3, line 5; Section 6.4 should be changed to Section 6.1.4.

RESPONSE

The requested change will be made. Work Plan, P. 6-2, Section 6.1.3; has been revised to read "Upgradient Dakota Sandstone monitoring wells should be constructed adjacent to upgradient Burro Canyon monitoring wells (Section 6.1.4)...".

COMMENT 25

P. 6-3, Section 6.1.6; DOE indicates that seven wells will be selected, Why seven? DOE must utilize as many as are necessary to do sufficient site characterization. It seems that DOE has already made a determination as to what wells are suitable for further characterization. **Provide EPA and the State with the well completion data for any and all wells that are used for OU III characterization.**

RESPONSE

See commitments provided in general comments 1, 2, 3, and 4. Well completion data will be provided in the investigation summary report on wells completed in 1992. Also see response to general comment 7.

COMMENT 26

P. 6-3, Section 6.1.7, paragraph 2, last line; Section 6.11 should be changed to 6.1.11.

RESPONSE

The requested change will be made. Work Plan, P. 6-4, Section 6.1.7; "Baseline ground-water quality conditions in the Dakota Sandstone on site should be inferred from baseline ground-water quality conditions in downgradient Dakota Sandstone monitoring wells (Section 6.1.11)."

COMMENT 27

P. 6-3, Section 6.1.8; Is it the purpose of the remedial investigation to site Burro Canyon wells in the alluvial flow-path or to site wells that can be used for characterization of the Burro Canyon aquifer? If the hydraulic gradients of the Dakota and Burro Canyon are essentially vertical beneath the alluvial aquifer, it seems that any location down-gradient in close proximity to the Millsite should be of value.

EPA and the State are concerned that DOE does not intend to construct any Dakota or Burro Canyon wells in close proximity to the Millsite

until such time as the tailings have been removed. Construction techniques are available to protect against contamination.

RESPONSE

Siting of wells is proposed to achieve both of the stated objectives. See also responses to general comments 1, 2 and 3.

See response to general comments 1 through 4.

COMMENT 28

P. 6-5, Section 6.1.11, line 6, Section 6.12 should be changed to Section 6.1.12.

RESPONSE

The requested change will be made. Work Plan, P 6-5, Section 6.1.11' "Another well should be installed adjacent to the newly installed Burro Canyon monitoring well (Section 6.1.12) ... ."

COMMENT 29

P. 6-5, Section 6.1.12; EPA and the State would like further justification for locating the Burro Canyon well 92-09 as far east of the millsite as is presently proposed.

RESPONSE

See response provided under general comments 2 and 3. DOE will be assessing the adequacy of the Dakota Sandstone/Burro Canyon wells to adequately represent the characteristics of a deeper aquifer "system" as compared to the need to assess two separate aquifer systems. Well 92-09 is located so as to be reasonably outside of the influence of cross-screened wells 83-70 and 84-74.

COMMENT 30

P. 7-1, Section 7.1; Apparently the OU III Health and Safety Plan will be tiered from the Monticello Remedial Action Project, Programmatic Health and Safety Plan, Revision 2. Please clarify this elsewhere in the test.

RESPONSE

The requested clarification will be provided. Work Plan, P. 7-1, Section 7.1; "The *Health and Safety Plan* describes task specific health and safety requirements for Geotech and subcontractor personnel as required by Section 1.3 of the *Monticello Remedial Action Project, Programmatic Health and Safety Plan, Revision 2* (Geotech 1991)."

COMMENT 31

P. 7-3, Section 7.3.4; EPA and the State recommend that an acceptance criteria of 5 nephelometric turbidity units (NTUs) be specified during well development. Turbidity in excess of 5 NTUs may be indicative of poor well development and will also effect ground water sampling analyses.

RESPONSE

DOE recognizes the value of nonturbid water as an indicator of good well development. However, if the formation water is turbid then turbidity does not indicate poor well development. Also, if the screened interval includes extremely fine-grained materials (a clayey sand) then 5 NTUs may be unobtainable by any design or development procedure (Handbook of Suggested Practices for Design and Installation of Ground-Water Monitoring Wells, EPA/600/4-89/034,1991).

Work Plan, P. 7-3, Section 7.3.2, paragraphs 1 and 2 respectively; "Wells will be developed according to the criteria presented in Section 5.1.4 of the *Field Sampling Plan.*" and "Stabilization criteria of pH, conductivity, temperature, and turbidity are given in Section 5.2.1 of the *Field Sampling Plan.*"

Field Sampling Plan, P. 5-7, Section 5.1.4, paragraph 2; was revised to read "During development the field parameters of pH, conductivity, temperature, and turbidity will be measured and the volume of water withdrawn from the well recorded. Development will be considered to be complete when the discharge water pumped from the bottom of the well is free of sand and silt, pH, conductivity and temperature have stabilized (criteria for stabilization listed in Section 5.2) and the turbidity of the water is less than 5 nephelometric turbidity units (NTUs). If this criteria cannot be met and turbidity has stabilized above 5 NTUs in addition to stabilization of other field parameters, a decision to continue well development will be made in conjunction with the EPA and the State of Utah after reviewing well construction information".

Field Sampling Plan, P. 5-8, Section 5.2.1, paragraph 2; has been revised to read "The introduction section of the "Standard Practice for Purging Monitor Wells" states that "When these parameters [pH, conductivity, and temperature] stabilize to ± 10 percent for two successive well volumes, the sampler can be reasonably assured that the stagnant water has been removed from the well casing." This purging criteria has been revised, and the stabilization criteria to be used will be: turbidity equal to or less than 5 NTUs, pH ± 0.3 pH units, and conductivity and temperature ± 10 percent each. Approximately one reading will be recorded for every ¼ borehole

volume evacuated. Samples will not be collected until a minimum of one borehole volume has been evacuated and each of the field parameters have stabilized, which is achieved when the three most current readings are within these criteria. If a well is purged dry, it is assumed that all stagnant water has been removed from the well, and sampling can occur as soon as the well has recovered sufficiently. If 5 NTUs cannot be attained and proper well construction and development have been demonstrated, sampling will occur and the results will be evaluated with consideration of sample turbidity. Continued sampling at this well location will be discussed with EPA and the State of Utah".

COMMENT 32

P. 7-4, Section 7.3.4, paragraph 2; The text indicates that aquifer pumping tests will be performed on the proposed upgradient Burro Canyon monitoring wells. However, the accompanying Field Sampling Plan (FSP) only provides standard test methods for slug tests. Additional discussion is necessary on aquifer pumping tests and an appropriate SOP should be included in the FSP. This comment also applies to the proposed pumping test for on-site Burro Canyon monitoring wells (see Section 7.3.7, paragraph 2). Aquifer pump test data, in conjunction with slug test information, is likely to be important in evaluating the feasibility of passive aquifer restoration.

RESPONSE

See response to Work Plan comment 3. Additional details on the methods to be used for the pump tests were added to the Field Sampling Plan in Section 5.6, AQUIFER TESTS.

COMMENT 33

P. 7-5, Sections 7.3.8, and 7.3.9; EPA and the State do not agree that downgradient surface water and alluvial ground water need not be analyzed for organic contaminants. DOE, as a minimum, needs to screen for organics and all other constituents in all wells developed for OU III site characterization.

RESPONSE

Water samples will be collected from downgradient alluvial wells and analyzed for organic compounds during the first sampling round. The need for additional testing of organics downgradient of the Millsite in subsequent rounds or in bedrock wells will be made on the basis of results from the first sampling round.

Work Plan, P. 7-6, Section 7.3.9, paragraph 2; "During the first sampling round, water samples will be analyzed for organic compounds. The need for additional testing of organic compounds downgradient of the millsite in subsequent rounds

will be made on the basis of results from the first sampling round."

Also refer to response to Field Sampling Plan comment 1.

COMMENT 34

P. 7-6, Section 7.3.10; This section was intended to pertain to downgradient Dakota Sandstone ground water, but the text erroneously discusses the installation of an upgradient monitoring well. The section should be revised accordingly. As noted elsewhere, EPA and the State believe that wells completed in the Dakota Sandstone are essential to full and complete characterization of OU III.

RESPONSE

Work Plan, P. 7-6, Section 7.3.10; "If water-producing zones are encountered while drilling the downgradient Burro Canyon monitoring well....".

COMMENT 35

P. 7-8, TASK 7 Assessment of Risks; DOE needs to clarify and explain the meaning of "the point of potential exposure" for purposes of conducting the risk assessment.

RESPONSE

Work Plan, P. 7-9, Section 7.7; "The contaminants and their concentrations at the point of potential exposure (at a well or surface-water site ...)...".

COMMENT 36

P 8-2, Proposed Work Schedule for Conducting Baseline Characterization.

We are concerned that DOE may be procuring a driller prior to responding to EPA and State comments on the proposed Work Plan. This is a Primary Document and EPA and the State have thirty days in which to accept or dispute the final.

EPA and the State do not believe that sufficient time has been included in the proposed schedule to properly develop the wells; and allow for a sufficient equilibration time between well development and the first sampling cycle.

EPA and the State believe that time can be saved between October 92 and February 94 during the report preparation phase. Much of the report can be prepared prior to or concurrent with the final sampling event. The final sampling results easily can be incorporated into the final document.

RESPONSE

The responses to comments included herein will be included in the OU III RI/FS Phase I investigation plans. Assuming the proposed responses are adequate, the investigation plans will be adequate. EPA/State concurrence on the proposed responses should be sufficient to allow DOE to move forward with procurement activities.

Well construction and development activities will be coordinated so that development occurs after the grout in the well has set. Well development will occur until the measured parameters of temperature, pH, conductivity and turbidity have stabilized (see also response to comment 31).

The proposed schedule change does not address DOEs schedule objective which is to collected ground-water samples from the alluvial aquifer during low water level conditions. It is DOEs objective to collect these samples this fall to allow for possible Millsite construction activities next summer which could disturb the conditions in the alluvial aquifer.

COMMENT 37

APPENDIX A: Evaluation of ARARs

DOE needs to determine whether the Bald and Golden Eagle Protection Act applies to potential impacts to habitat. It may become an ARAR for OU III.

RESPONSE

This ARAR will be considered. P. A-7, Section A2.2; "Bald and Golden Eagle Protection Act. This act provides for the preservation of the bald and golden eagle through the protection of the individual raptor and its prodigy."

COMMENT 38

COMMUNITY RELATIONS PLAN UPDATE

An addendum specific to Operable Unit III needs to be developed as part of DOEs responsibilities under CERCLA. A series of Fact Sheets for OU III need to be developed as well. It is our understanding that a Community Survey was conducted; EPA and the State should be forwarded a copy of the survey, as-well-as the results, to determine if the survey was adequate.

Attachment I - Mailing List of Key Contacts. This list needs to be updated for the addendum or for any future mailings.

RESPONSE

The requested activities will be implemented. Information received as part of a survey of residents concerns with drilling activities associated with OU III has been provided to EPA/State.

The mailing list will be updated as required.

FIELD SAMPLING PLAN - Specific Comments

COMMENT 1

P. 3-8, Section 3.7.1, paragraph 4; The text states that no organic compounds are present in downgradient alluvial ground water based on analytical results from an October 1991 sampling event at monitoring well 88-87. This statement cannot be supported based on analytical data from a single well and one sampling event.

RESPONSE

P. 3-8, Section 3.7.1, paragraph 4; has been was revised to read "... Monitoring well 88-87 was sampled for VOCs and semiVOCs, pesticides, PCBs, and herbicides during October 1991; these analytical results indicate that no target compound list (TCL) organic compounds are present above the method detection limits in the ground-water samples collected from this well."

P.4-4, Section 4.3, paragraph 1; has been revised to read "...Downgradient surface-, Dakota Sandstone, and Burro Canyon ground-water samples will be analyzed for TCL metals plus boron, molybdenum, and strontium, major anions, major cations, TDS, gross alpha-particle activity, gross beta-particle activity, and radionuclides (lead-210, radium-226, radium-228, radon-222, thorium-230, thorium-232, uranium-234, uranium-238, and polonium-210). Downgradient alluvial ground-water samples will be analyzed for the analytes listed above and VOCs, semiVOCs, pesticides/PCBs, and chlorinated herbicides. If organic compounds are detected in any samples collected from the downgradient alluvial monitoring wells during the first sampling round, the EPA and State of Utah will be contacted and an appropriate course of action will be determined for organic compound analyses of water samples collected from downgradient alluvial, Dakota Sandstone, and Burro Canyon wells and downgradient surface water in subsequent sampling events."

P. 4-2, Table 4-1; has been revised to reflect the changes in organic analyses of downgradient alluvial ground-water samples.

Also see response to Work Plan comment 33.

COMMENT 2

P. 3-9, Section 3.8.1; Further characterization of the Dakota water quality is necessary. Elsewhere in documents it has been stated that lower strata in the Dakota Sandstone are water bearing and differentiation from the Burro Canyon Formation is difficult. In the absence of appropriate characterization of the water quality it must be assumed to be a potential drinking water source and therefore protected by Utah ARARs (State of Utah Ground Water Quality Protection Regulations).

RESPONSE

See response to general comment 2.

P. 3-9, Section 3.8.2; text was revised to read "Upgradient monitoring well(s) will be installed if water-producing zones (as determined by driller observation, core inspection, or evaluation of geophysical logs of the borehole) in the Lower Dakota Sandstone are encountered during drilling of the upgradient Burro Canyon monitoring wells. A downgradient monitoring well will be installed in the Lower Dakota Sandstone.

If upgradient Dakota monitoring well(s) are installed they will be constructed and sampled to establish background water-quality conditions in the Lower Dakota Sandstone ground water. In addition, measurements of the basic water-quality parameters will provide information on the geochemistry of the hydrologic system. Ground-water-level measurements will provide data that will help define the direction and gradient of ground-water flow. Slug tests will be performed on the newly installed well(s) to provide data on hydraulic conductivity.

The objective of downgradient Lower Dakota Sandstone ground-water sampling is to determine the presence or absence of contaminants, and if present, to determine the respective concentrations. Analytical results of samples collected from the downgradient Lower Dakota Sandstone monitoring well will indicate the possibility of contaminants being transported off site. Contaminant concentrations will be compared to EPA, State of Utah, and/or UMTRCA standards to determine if any standards are exceeded. In addition, measurements of the basic water-quality parameters will provide information on the geochemistry of the hydrologic system and help indicate changes as a function of time. The vertical gradient between the Lower Dakota Sandstone and alluvial ground water will be determined by measuring ground water levels in these two units. A slug test will be performed on the newly installed monitoring well to provide data on the hydraulic conductivity of the Lower Dakota Sandstone. Pumping tests may be performed on the Lower

Dakota Sandstone well if the slug test results indicate there is an adequate water-producing zone".

COMMENT 3

P. 3-9, Section 3.9.1; EPA and the State feel that inadequate information has been developed concerning possible differential flow paths (fractures, wells, etc.) through the Dakota. This information is needed to assure protection of the Burro Canyon aquifer.

RESPONSE

See response to general comments 1 and 2 and specific Work Plan comments 3 and 4.

P. 3-10, Section 3.9.1, paragraph 2; "...These wells may not be adequate to assess potential contamination of the Burro Canyon aquifer on site because they may not be located in an area recharged by contaminated ground water from the millsite. Installation of on-site Burro Canyon monitoring wells will occur during a later phase of the remedial investigation and will be described in revisions to the Work Plan and this FSP".

COMMENT 4

P. 3-10, Section 3.9.2, final paragraph; One monitor well downgradient in the Burro Canyon is not adequate to monitor water quality as it leaves the site.

RESPONSE

See response to general comment 3.

P. 3-11, Section 3.9.2, last two paragraphs; "Analytical results from downgradient sampling of Burro Canyon monitoring well 84-74 indicate the possibility of contaminants being transported off site. To further characterize the water-quality conditions of the Burro Canyon ground-water downgradient, an additional monitoring well will be installed. The objective of downgradient Burro Canyon ground-water sampling is to determine the presence or absence of contaminants, and if present, to determine the respective concentrations. Analytical results of samples collected from the newly installed well will be compared to results from wells 83-70, 84-74, and the newly constructed downgradient Lower Dakota well to provide information on whether or not the water-producing member of the Lower Dakota Sandstone is unique from the Burro Canyon aquifer. Basic water-quality parameter measurements will provide information on the geochemistry of the hydrologic system and help indicate changes over time and distance."

COMMENT 5

P. 4-1, Section 4.1.1; Is the alluvium of the unnamed creek a significant source of water or conduit for contaminants?

RESPONSE

Work Plan, P. 6-1, Section 6.1.1; was revised to read "A sampling location on the unnamed creek to the south of South Creek is not necessary at this time because the unnamed creek is not thought to be a significant source of water or conduit for contaminants"s. This position may change based on the results of this Phase I investigation.

COMMENT 6

P. 4-1 Section 4.1.2; The numbering of proposed new wells does not agree with Plate 4-2. There is no problem with the well locations or the siting rational but the numbering is incorrect. There are a number of errors in this section and it should be rewritten.

RESPONSE

P. 4-1, Section 4.1.2; has been rewritten to read "Upgradient alluvial, Burro Canyon and, if installed, Lower Dakota Sandstone monitoring wells will be located as close as possible to the upgradient surface-water sampling locations--(1) South Creek (upgradient of the confluence with Montezuma Creek and just west of the Municipal Golf Course [92-01 and 92-02]); (2) North Creek (upgradient of the confluence with Montezuma Creek and just northwest of the Municipal Golf Course [92-03 and 92-04]); and (3) Montezuma Creek (just west of U.S. Highway 191 and east of an abandoned sewage disposal plant [92-05 and 92-06]). At each location, one alluvial aquifer and one Burro Canyon monitoring well will be constructed and, if feasible, a Lower Dakota Sandstone well.

Ground-water samples will be collected from 10 existing wells located on the millsite. Seven of the wells are constructed in the alluvial aquifer (82-30B, 82-31B-W, 82-36A, 82-40A, 82-42, 31SW91-14, 31SW91-23) and three are in the Dakota Sandstone/Burro Canyon (84-75, 84-76, and 84-77). Downgradient of the millsite, a total of 10 wells will be sampled. Two of the alluvial aquifer wells already exist (88-85 and 82-07). Access to the existing well locations have been restricted in the past years resulting in unknown well conditions. If degradation has occurred to these wells and they are unsuitable for ground-water sampling, additional wells will be constructed near the original locations. Four additional wells will be constructed in the alluvial aquifer (92-07, 92-08, 92-09, and 92-11). Two Lower Dakota Sandstone/Burro Canyon wells (83-70 and 84-74) will be sampled. An additional Burro Canyon well

(92-10) will be constructed near well 92-09. An additional Lower Dakota Sandstone monitoring well (92-12) will be constructed near the north edge of the existing stock pond just east of the MMTS; this well will be constructed adjacent to alluvial well 92-11. These wells will be located near each other and in the pre-millsite channel of the Montezuma Creek."

COMMENT 7

P. 4-2, Section 4.3; As stated previously, EPA and the State recommend that an acceptance criteria of 5 nephelometric turbidity units (NTUs) be specified during well development and during sampling.

RESPONSE

See response to Work Plan comment 31.

COMMENT 8

P. 4-4 Section 4.4.1; The description of a trip blank is incorrect, trip blanks should be prepared in the laboratory from type II water and transported back and forth to and from the field.

RESPONSE

The trip blank description is correct and will be prepared in the field. No revisions were made to the text.

COMMENT 9

P. 5-1, Section 5.1, paragraph 1; The FSP proposes to discard purge water on the ground in the vicinity of the well being purged. While it may be acceptable to dispose of purge water on the Millsite, it is recommended that purge water at least be discharged away from the monitoring wells. Disposing of purge water near a well could potentially result in vertical leakage of contaminated water along the well casing or percolation through the subsurface. Either of these scenarios could conceivably affect the interpretation of site characterization by: 1) reintroducing contaminants into the subsurface; 2) leaching contaminants from the subsurface to the water table; or 3) altering the water levels in monitoring wells through recharge, thereby affecting the determination of ground-water gradients and flow velocities.

RESPONSE

P. 5-7, Section 5.2.1, paragraph 1, last sentence; The text was revised to read "Purge water will be discharged on the ground away from the monitoring wells."

COMMENT 10

P. 5-1, Section 5.1, paragraph 2; It is recommended that at a minimum the "standard" three well volumes be purged from wells plus stabilization of field parameters (including NTUs) prior to sampling to ensure adequate flushing of the sand pack.

RESPONSE

See response to specific Work Plan comment 31, and Field Sampling Plan comment 7.

COMMENT 11

P. 5-1, Section 5.1 and Appendix A; EPA requires a concrete surface pad for monitoring wells. The pad provides protection and promotes drainage away from the well head. Significant storm events will wash out bentonite mounding.

RESPONSE

P. 5-3, Section 5.1.1, paragraph 6; was revised to read "...A concrete pad will be installed having a minimum thickness of 4 inches and sloping away and extending two feet from the protective cover. This concrete pad will provide protection and promote drainage away from the well head...."

P. 5-6, Subsection 5.1.3, paragraph 4; The following sentence was added to the text "A steel cover, cement pad, and guard posts will be installed at each piezometer location in the same manner as described in Section 5.1.1."

COMMENT 12

Section 5.4, General; The section provides general information on monitoring well installation but is too vague to a low EPA to comprehensively review the proposed procedures or ensure that the field personnel will perform the required activities correctly and consistently. The associated SOPs are also very general and provide information on a number of well installation techniques, many of which are not applicable to the site. It is unclear exactly which procedures will be followed on this project. DOE needs to specify which methods will be used and under what conditions. For example, what is the proposed well diameter? Will samples for logging be collected throughout the entire borehole for alluvial wells? The criteria should be specified that will be used to determine where the screened interval will be placed and what it maximum length can be. Will grain size analyses be performed to determine the appropriate screen slot and sand pack size? Will the screen be inspected, to make sure that is was not damaged in transit or handling, prior to insertion into the well? How will a "suitable" sealing grout be selected (what are its constituents and mixture ratios)? Which wells will have protective posts installed and which will be flush-mounted (see General Comment No. 6 for suggested reference material).

RESPONSE

See response to general comment 6.

P. 5-1, Section 5.1.1; was revised to read "A truck-mounted hollow-stem auger rig will be used for borehole drilling and well installation. Augers shall be a minimum of 7 5/8-inch outside diameter (O.D.) by 4 1/4-inch inside diameter (I.D.) with a retrievable center bit or flexible plug that will be locked in place at all times.

A 3-inch O.D. by 24-inch long split-barrel sampler will be driven ahead of the auger to collect samples for logging of the lithology. Other similar type sampling devices may be used if they are found to be better suited for site conditions (e.g., continuous split-barrel sampler). Using a 140-pound drop hammer or equivalent hydraulic driver with a 30-inch drop, the sampler will be driven for the length of the sampler or until sampler refusal (no further penetration is achieved after 50 blows for each six inches of penetration). Once the sampler is full or no further penetration is possible, the sampler will be removed from the borehole and separated from the drive-rod assembly. The sampler will be laid flat on an uncontaminated surface and the head and drive shoe removed. One-half of the split barrel will be removed, allowing the lithology to be described and recorded. Drilling procedures as related to split spoon sampling and lithologic logging are described in Appendix A.

Drilling and sampling will continue until the on-site geologist is assured that competent underlying bedrock has been reached (either the Mancos Shale, Dakota Sandstone, or Burro Canyon Formation). Drilling into the bedrock will be minimized. All drill cuttings and samples from contaminated areas will be contained and subsequently transported to the millsite for later disposal during remediation. Drill cuttings from uncontaminated areas (areas upgradient of the millsite) will be placed on the ground for latter disposal.

Before the hollow-stem augers have been removed from the borings, the borehole will be radiometrically logged using a portable gross-count system .... (additional details concerning radiometric logging are contained in Section 5.1.1).

While the borehole is being radiometrically logged, a grain-size distribution analysis will be conducted on the soil sample that corresponds to the finest-grained unit or subinterval from the interval to be screened. The finest-grained material will be chosen because it is expected that the alluvium will be heterogenous in nature and that a filter pack sized to suit the finest-grained material will filter out this material during development. Geotech Procedure SL-23(T), "Standard Method for

Sieve Analysis of Fine and Course Aggregates", will be used for the grain-size distribution analysis (Appendix A). Sieve analyses will be performed at each alluvial well or piezometer location until an alternative method of filter pack grain size selection is negotiated with EPA and the State of Utah.

Filter pack size will be determined by multiplying the 70 percent retained grain size of the formation by a factor of 6 since it is expected that the alluvium is predominantly coarse and non-uniform. If the lithologic log shows that the formation is finer and more uniform than expected, then the 70 percent retained size will be multiplied by a factor not less than 4. The filter pack material will be uniform and consist of washed, well-rounded silica sand.

Well screen slot size will be determined on the basis of the filter pack grain size such that 90 percent of the filter pack material is retained. If a slot size is not available in the size indicated by the criteria above, then the nearest standard slot size will be used.

Well-screen depth intervals will be selected on the basis of borehole lithology, water levels, and project objectives. The primary objective is to characterize the ground-water quality of the alluvial system. The secondary objective is to perform slug tests to calculate the hydraulic conductivity of the alluvium. Because contaminants identified at the millsite are not expected to be vertically distributed within the alluvial ground-water system, the well screen is not required to cover the entire saturated thickness. Also, a screen length less than the saturated thickness of alluvium and installed below the water table aids in slug test analysis. Therefore, the screen length will be the maximum 5-foot incremental length such that the saturated thickness is not exceeded. For example, if 8 feet of saturated alluvium is encountered in a borehole, then 5 feet of screen will be installed. Or, if 24 feet of saturated alluvium is encountered, then 20 feet of screen will be installed. The length of the well screen is expected to be approximately 20 feet in upgradient wells and to range from 5 to 15 feet in downgradient wells.

Monitoring wells will be constructed using 2-inch I.D., flush-jointed, threaded, schedule 40, polyvinyl chloride (PVC) casing and slotted well screen. Each joint will have an O-ring seal or threads coated with teflon tape. Glues or cements will not be used to connect sections of well casing or screens. All well casing and screens will be inspected before insertion into the wells to ensure that no damage or contamination has occurred during handling and/or transportation.

The casing assembly will be installed through the hollow-stem augers. The size of the borehole, the diameter of the casing,

and length of filter pack will be used to calculate the volume of filter pack required. The filter pack will be installed from the bottom of the casing to at least two feet and not greater than 3 feet above the top of the well-screen. A 1-foot interval of finer grained sand will placed above the filter pack material to help prevent intrusion of the bentonite seal into the filter pack.

A 2- to 3-foot bentonite pellet seal will be placed on top of the sand pack and hydrated. Hydration of the bentonite pellets will be conducted by slowing pouring approximately 10 gallons of municipal water down and along the inside surface of the augers. The remainder of the annular space around the casing will be grouted to within 3 feet of the surface with a non-shrinking and bentonitic sealing grout (e.g., Voclay grout, EnviroPlug grout, etc.). The grout will be mixed at the recommended manufacturer's mixture ratios. The remaining 3 feet will be concreted to the surface.

The sand, bentonite, and grout will be placed sequentially as the hollow-stem augers are retrieved from the borehole. The hollow-stem augers will not be raised more than 2 feet above the material level in the annular space during material installation.

A steel cover that is hinged, weatherproof, and has a locking cap will be placed over the riser casing and cemented in place. A concrete pad will be installed having a minimum thickness of 4 inches and sloping away and extending two feet from the protective cover. This concrete pad will provide protection and promote drainage away from the well head. All wells will be protected from potential surface damage by the placement of three evenly spaced steel guard posts approximately 2 feet from the well cover. The posts will be painted for visibility in high-traffic/activity areas.

All drilling and logging equipment will be cleaned with a high-pressure hot-water washer or steam cleaner before the start of drilling. Between borings, equipment will again be cleaned with hot water or steam. After hot-water or steam cleaning, all down-hole equipment will be allowed to air dry prior to re-use of equipment. A decontamination pad will be constructed using plastic sheeting spread over a natural or man-made depression or by using a holding tank for the cleaning of drilling equipment. The decontamination pad will be designed to ensure that the decontamination fluids are impounded or containerized for later disposal.

Additional drilling and well installation procedures are included in Appendix A.

P. 5-4; 5.1.2 Bedrock Well Installation

Monitoring wells will be installed in the Burro Canyon and the Lower Dakota Sandstone Formations using air/mist rotary as the drilling method. If air or air/mist rotary can not be successfully used to maintain a stable borehole through the alluvium, mud rotary techniques will be implemented for installation of the surface casing. Air rotary techniques will be used to penetrate the overlying unconsolidated deposits and Mancos Shale Formation. To prevent contamination of the aquifer from drilling activities, all drilling fluids (water and/or mud) will be approved by Geotech before being used. Drilling water will be obtained from the City of Monticello Municipal system (e.g., fire station). Approximately four water samples will be collected from the driller's water tank during the drilling activities and analyzed for the constituents listed in Table 4-2 to evaluate the quality of the water source.

At Burro Canyon Formation and downgradient Lower Dakota Sandstone and well locations, bedrock ground water will be protected from contamination in the overlying alluvium by installing a large diameter permanent casing to the top of bedrock. The annulus between the casing and the borehole wall will be cemented from the casing seat to the surface to prevent downward migration of fluids. This will be accomplished by placing a drillable cementing plug between the cement and the displacement fluid. The plug will minimize dilution of the cement and maintain positive pressure while the cement cures. The cement will be allowed to set before further drilling operations are initiated. After the cement has properly cured, the cement plug will be drilled out. The Middle and Lower Dakota Sandstone will be cored during drilling of the Burro Canyon monitoring wells and the Middle Dakota Sandstone will be cored during drilling of the Lower Dakota Sandstone monitoring wells. The boreholes will be reamed out and a smaller diameter steel casing will be cemented in place as above. The second set of steel casing serves to isolate the Lower Dakota Sandstone from the Burro Canyon Formation for the Burro Canyon wells and to isolate the Middle Dakota Sandstone from the Lower Dakota Sandstone for the Lower Dakota Sandstone Wells. Coring will then continue through the Lower Dakota Sandstone for the Lower Dakota Sandstone monitoring wells and to the desired depth in the Burro Canyon Formation for the Burro Canyon monitoring wells.

Upgradient Lower Dakota Sandstone wells will not be cored because the Burro Canyon well adjacent to the Lower Dakota Sandstone monitoring well will have been cored. Permanent steel casing will be installed to the base of the Middle Dakota Sandstone as described above.

Coring will be accomplished by using a minimum size 2 1/8-inch I.D., double tube, swivel-type core barrel with appropriate

bits and air or air/mist as the circulation medium. Core samples of the Dakota Sandstone and Burro Canyon Formation will be placed in properly labeled core boxes. A lithology log will be prepared for each monitoring well on the basis of core samples. Core samples from each well will be submitted to a subcontract laboratory for analysis of vertical hydraulic conductivity. Two indiscriminate samples will be selected from the Burro Canyon monitoring wells at depths that correspond to approximately the ⅓ and ⅔ depths of the screened interval. Core samples will also be selected at the depth interval that corresponds to approximately the midpoint of the Upper and Lower units from the Dakota Sandstone. A minimum 2-inch by 2-inch or larger size core sample is required for analysis. The core sample will be placed in a labeled, sealing plastic bag to help retain formation moisture and shipped with bubble-wrap packing material to minimize disturbance.

Downhole digital geophysical logging will be conducted in the Burro Canyon and Dakota Sandstone borings to assess the lithologic characteristics of the formations, the variation in moisture content (porosity), and the vertical extent of radiologic contamination (if present). After the borehole has been reamed and before the well casing and screen is installed, the open borehole will be logged for the following measurements; natural gamma, spontaneous potential (SP), resistivity (normal), neutron porosity, temperature, and caliper. For quality assurance purposes, a minimum of 50 feet will be re-logged and two-point calibrations for each measurement will be performed before and after logging for every monitoring well logged. The geophysical logs will be used in the field to assist in determination of well screen placement.

On the basis of the lithologic description of core from the Dakota Sandstone and Burro Canyon Formations the on-site Geotech geologist will determine the proper size of filter pack material and screen slot size for each well. It is anticipated that both the Dakota Sandstone and Burro Canyon Formations consist of fine-grained sandstone and that the filter pack size will range from 20 to 40 mesh. If this filter pack size is indicated through observation of the core then Number 10 screen slot size will be used. The filter pack material will be washed, well-rounded silica sand.

Well-screen length and depth interval for Burro Canyon wells will be determined by the depth to water and the presence of a mudstone layer that is typically encountered not more than 10 feet below the Dakota Sandstone/Burro Canyon Formation contact. If core and/or geophysical logs of the borehole indicate that the mudstone is not present and the Burro Canyon is saturated in its entirety, the well screen will be set at least 5 feet below the

Dakota Sandstone contact so that the filter pack sand and 1-foot layer of fine sand above the filter pack sand does not extend into the Dakota Formation. Approximately 30 feet of well screen will be installed. If the mudstone is not present and the Burro Canyon is not saturated, drilling will continue until a water-producing zone is reached and approximately 30 feet of the saturated material will be screened.

If the mudstone in question is present then it will be assumed that it may be an effective confining unit such that the water quality above and below the mudstone may differ. In this case the screen will be set at least 5 feet below the mudstone so that no filter pack sand extends into the mudstone. Approximately 30 feet of screen will be installed.

For the Lower Dakota Sandstone well(s), the entire length of the Lower Dakota will be screened. The screen or filter pack will not extend into the middle Dakota or Burro Canyon.

Monitoring wells will be constructed using 4-inch I.D., flush-jointed, threaded, schedule 40, polyvinyl chloride (PVC) casing and slotted well screen. Each joint will have an O-ring seal or threads coated with teflon tape. A sand filter pack will be placed in the annulus between the screen and the borehole wall and will be installed from the bottom of the casing to at least two feet and not greater than 3 feet above the top of the well screen followed by a one-foot interval of finer grained sand.

A minimum 3-foot bentonite pellet seal will be placed on top of the sand pack and hydrated. The remainder of the annular space around the casing will be grouted to within 3 feet of the surface with a non-shrinking and bentonitic grout and mixed at the manufacturers recommended ratios. The remaining 3 feet will be concreted to the surface. The 4-inch bedrock wells will be completed at the surface in the same manner as the alluvial wells. Each well will be allowed to set undisturbed for at least 40 hours before well development to insure proper seal hydration and grout curing.

P. 5-6; 5.1.3 Piezometer Installation

Eighteen soil borings will be drilled and continuously split-barrel sampled from the ground surface to the top of competent underlying bedrock formation in the same manner as the alluvial wells (Section 5.1.1). Soil samples collected from the borings will be used to prepare lithologic logs. Nine of these soil borings will be completed as piezometers on the basis of being able to provide useful information on ground-water elevation.

After the borehole has been sampled to competent bedrock, a portable gross-count gamma-measuring instrument will be used to log the boring through the hollow-stem augers (Section 5.1.1).

This log will allow a qualitative interpretation of radionuclide contamination in the borehole.
While the borehole is being radiometrically logged, a sieve analysis will be conducted to determine the filter pack material size and screen slot size to be used for piezometer installation (Section 5.1.1). Two-inch I.D., threaded, flush-joint, schedule 40, PVC casing and slotted screen will be used to construct each piezometer. The screen will be 2.5 feet long and will be placed above the alluvium/bedrock contact. The filter pack will be placed around the annular area between the casing and the borehole wall to 2 feet above the top of the screened interval. A 1-foot interval of fine-grained sand will placed above the filter pack material; a 1-foot bentonite pellet seal will be place on top of the fine-grained sand and hydrated with no more than 5 gallons of municipal water. The remaining borehole annulus will be grouted using a non-shrinkable bentonitic grout to with in three feet of the surface. The remaining 3 feet will be cemented to the surface.

A steel cover, cement pad, and guard posts will be installed at each piezometer location in the same manner as described in Section 5.1.1.

P. 4-3, Section 4.1.3; has been revised to read "Soil borings will be located along three, north-south transects in the area east of the MMTS and west of the area where Montezuma Canyon narrows. These transects will be located near well 84-74 and proposed wells 92-08 and 92-09 (Plate 4-2). Approximately six borings will be drilled along each transect until bedrock is encountered. The first boring location along each transect will occur near the stream channel or inferred historic stream channel. Subsequent boring locations will be decided in the field considering the depth of alluvium at borings drilled and the horizontal distance to exposed bedrock. Nine of these soil borings will be completed as piezometers."

COMMENT 13

P. 5-6, Section 5.4.2, paragraph 3; What criteria will be used to determine when a core sample from the Burro Canyon Formation should be collected for vertical hydraulic conductivity testing? How much sample is required and how will it be packaged and handled to minimize disturbance of the sample prior to analysis?

RESPONSE

P. 5-4, Section 5.1.2, paragraph 4; was revised to read "Coring will be accomplished by using a minimum size 2 1/8-inch I.D., double tube, swivel-type core barrel with appropriate bits and air or air/mist as the circulation medium. Core samples of the Dakota Sandstone and Burro Canyon Formation will be placed in properly labeled core boxes. A lithology log will be prepared

for each monitoring well on the basis of core samples. Core samples from each well will be submitted to a subcontract laboratory for analysis of vertical hydraulic conductivity. Two indiscriminate samples will be selected from the Burro Canyon monitoring wells at depths that correspond to approximately the ⅓ and ⅔ depths of the screened interval. Core samples will also be selected at the depth interval that corresponds to approximately the midpoint of the Upper and Lower units from the Dakota Sandstone. A minimum 2-inch by 2-inch or larger size core sample is required for analysis. The core sample will be placed in a labeled, sealing plastic bag to help retain formation moisture and shipped with bubble-wrap packing material to minimize disturbance."

COMMENT 14

P. 5-6, Section 5.4.2, paragraph 4; What procedures will DOE follow to ensure that all drilling fluids/mud are contaminant free? Will the water source used be tested?

RESPONSE

P. 5-4, Section 5.1.2, paragraph 1, sentence 4; was revised to read "...To prevent contamination of the aquifer from drilling activities, all drilling fluids (water and/or mud) will be approved by Geotech before being used. Drilling water will be obtained from the City of Monticello Municipal system. Approximately four water samples will be collected from the driller's water tank during the drilling activities and analyzed for the constituents listed in Table 4-2 to evaluate the quality of the water source."

COMMENT 15

P. 5-8, Section 5.9; It is unclear whether well inspections and water level measurements will only be performed on wells that are being sampled or on selected additional wells also. DOE should ensure that the spatial distribution of the wells chosen for water level measurement is adequate to address the data limitations identified in Section 5.2.3 of the Work Plan.

RESPONSE

P. 5-15, Section 5.8; was revised to read "Well inspections will be performed monthly on selected existing and all newly installed monitoring wells as outlined in "Standard Practice for the Inspection and Maintenance of Groundwater Monitoring Wells" (Geotech Procedure LQ-18(P), Appendix A)."

Adequate water level measurements will be taken to evaluate hydraulic gradients in the aquifer systems.

COMMENT 16

P. 6-1, Section 6.1; Elaborate on the system that will be used by the field crew to assign the six digit sample number to each sample station. It is assumed that the field duplicate samples will not be designated as such and will be submitted (with a unique six digit sample number) as "blind" samples to the laboratory.

RESPONSE

P. 6-1, Section 6.1, paragraph 1, sentence 3; was revised to read "Each sample location will also be assigned a unique sample number (bar coded) consisting of three letters followed by three numbers (i.e., XXX001; these are sequential sample numbers used on Geotech projects) that are sequential with the preceding sample number. The sample numbers will be assigned by the field crew at the time of collection, and will be recorded in both the field logbook and on the Water Sampling Field Data form used for each well. Samples collected for quality control purposes will be assigned an identifier similar to the well locations (i.e., 82-20), as well as a six-digit sample number. Field duplicates will not be designated as such and will be submitted blind to the analytical laboratory."

COMMENT 17

Appendix A: The SOP concerning sampling should specify that bailers will be used to collect VOC samples in order to minimize the potential for volatilization of contaminants. Does DOE have specific instructions for collecting samples for organics. It should also be specified that surface water sampling locations will be approached form the downstream side in order to minimize the potential for introducing sediments into the sample from walking in the creek. Surface water samples should also be collected from the middle of the stream. DOE needs to address in greater detail how glass ware, equipment, etc., will be transported and protected.

RESPONSE

There is a general procedure for sampling organics in Appendix A Geotech Procedure LQ-12(P), Section 8, "Sampling for Volatile Organics"

P. 5-9, Section 5.2.1, paragraph 1, first sentence; was revised to read "Ground-water samples that will be analyzed for VOCs, semiVOCs, pesticides/PCBs, herbicides, and radon-222 will be sampled with a dedicated bladder pump or a teflon bailer as outlined in Methods B or C in the "Standard Practice for the Sampling of Liquids" (Appendix A, Geotech Procedure LQ-11[P])."

P. 5-9, Section 5.2.2, paragraph 1; was revised to read "Surface-water sampling locations will be approached from

downstream to minimize the potential for introducing sediments into the sample from walking in the creek. Surface- water field parameters (e.g., pH, temperature, conductivity, and alkalinity) will be taken insitu. Surface-water samples will be collected from the middle of the stream. Surface-water field measurements will be taken insitu. Surface-water samples collected for the analysis of VOCs will be sampled by container immersion by pointing the bottle mouth upstream as outlined in Method G (Geotech Procedure LQ-11(P), Appendix A). All other surface-water samples will also be collected by container immersion, except for those requiring filtration, which will be collected with a peristaltic pump (Method A). Filtration and chlorine measurements of the surface-water samples will follow the methods discussed in Section 5.2.1."

P. 6-1, Section 6.4, paragraph 1; The text reads "All containers used will be new and pre-cleaned and obtained from an EPA-approved supplier. Suppliers will provide certificates of cleanliness. Containers will be visually inspected for integrity and cleanliness prior to use. Suspect containers will not be used will be discarded.

All bottles to be used for the collection of VOC samples will be stored in a cooler with Blue Ice and/or wet ice until just before collection of sample and will be returned to a ice chest immediately after the VOC sample has been collected. Water samples requiring filtration will be filtered with a 0.45-micron filter. Samples required to be cooled will be stored in a ice chest (cooler) between 0 ° and 4 °C. For samples preserved with acid, pH levels will be checked with pH paper to ensure correct preservation levels are obtained as required in Table 6-1. Samples collected for VOC and radon-222 analysis will be collected with no headspace or bubbles. All other samples will be filled to approximately 90 percent capacity to allow for expansion of the contents. If the container overflows when being filled with the collected sample, the exterior of the container will be rinsed with distilled water and wiped dry before being packed for shipment.

Samples will be packaged and shipped in a manner that will protect sample integrity as well as protect against leakage. Glass sample containers will be placed in plastic bags and if necessary, placed in foam socks or equivalent material (e.g., bubble wrap) to prevent breakage and packed in vermiculite or similar material.

All water samples will be handled, packaged, and shipped as environmental samples. Those samples that contain high concentrations of radioactivity determined on the basis of field screening methods (i.e., beta-gamma measurements by health and safety technicians) will be handled, packaged,

labeled, and shipped according to the regulations issued by the U.S. Department of Transportation (DOT), 49 Code of Federal Regulations (CFR) parts 171 through 178, and EPA sampling, packaging, and shipping methods 40 CFR 260.

Each shipment of samples will be accompanied by a signed Chain of Custody/Evidentiary File form that specifies the analyses required for each sample and any unique handling requirements."

P. 6-5, Section 6.5, paragraph 1; The text reads " The shipping container will have custody seals and/or evidence tape placed over the container opening and one hinge before shipment to ensure the integrity of the samples is not compromised during transportation. The receiving laboratory must examine the seals on arrival and document that the seals are intact. Upon opening the container, the condition of the sample containers will also be noted (e.g., broken bottles, leaking bottles, broken seal around the lid, temperature within the ice chest, etc.). Unused bottles and ice chests that have been transported by the field teams to the Project site or sampling location will be kept in a secure location (e.g., field office storage area) to minimize tampering, damage, and possible contamination."

QUALITY ASSURANCE PROJECT PLAN (QAPjP)

COMMENT 1

P. ix, Section 3.0, First sentence under DOCUMENT PREPARATION, APPROVAL AND DISTRIBUTION LIST; Chem-Nuclear Geotech's name should either be removed or defined here. "Geotech" is used more than once before being defined in the second paragraph under INTRODUCTION on page 1-1. This is confusing to the unfamiliar reader.

RESPONSE:

Revised as suggested. Chem-Nuclear Geotech is defined on P. ix, Section 3.0. Remove the definition from the second paragraph of the Introduction P. 1-1.

"Geotech is the operating contractor for the U.S. Department of Energy, Grand Junction Projects Office (DOE-GJPO)."

COMMENT 2

P. 2-1, Section 2.0; The example language of the Region V Model QAPjP suggests more detail for the project description than given here, however the Region V Model as well as Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (USEPA

1988) indicates that other documents which are part of the RI/FS may be referenced for information appropriate for the QAPjP.

RESPONSE:

A reference to the Region V Model QAPjp has been added to P. 1-1, INTRODUCTION, paragraph 3, last sentence; ". . . and the guidance suggested in the EPA Region V Model QAPjP (USEPA 1991)." and to Section 16.0; "_____ 1991. *Model Quality Assurance Project Plans (QAPjP)*, Region V Office of Superfund, May 1991."
No other changes to the QAPjP are required pertaining to this comment. The QAPjP will continue to reference other documents which are part of the RI/FS for information appropriate to the QAPjP.

COMMENT 3

P. 2-2, Section 2.4; The Region V Model QAPjP gives considerably more detailed "boilerplate" (defined as pre-approved) language (sections 1.4-1.6, p 7) than contained in this section. If appropriate, DOE may reference the Work Plan (which is acceptable according to guidance) for most of this information.

RESPONSE:

P. 2-2, Section 2.4, FIELD SAMPLING RATIONALE, was evaluated against the "boilerplate" language of the Region V Model QAPjP as suggested.The elements of 1.4 of the "boilerplate" are sufficiently addressed in Section 6.0 of the Work Plan as referenced in paragraph 1 of Section 2.4, P. 2-2; ". . . in Section 6.0 of the WP."

P. 2-2, Section 2.4 paragraph 2, third sentence is revised. Also, the fourth sentence has been removed and replaced by a sentence that specifies the frequency of the sampling. These changes were made to address the elements of Section 1.5 of the Region V Model QAPjP; ". . . Details about the number, types, methods, etc., for water samples are provided in Section 4.0 of the FSP, Table 4-1, Proposed Surface- and Ground-Water Sampling Locations for Baseline Characterization of the Monticello Mill Tailings Site, OU III. Samples will be collected four times within the first year of the remedial investigation."

A new Section 2.5, DATA QUALITY OBJECTIVES, has been added to address the elements of Subsection 1.6 of the Region V Model QAPjP. The prior draft Section 2.5, PROPOSED WORK SCHEDULE, is renumbered as Section 2.6; "Data Quality Objectives (DQOs) are qualitative and quantitative statements that specify the quality of the data required to support decisions made during the RI/FS activities and are based on the end uses of the data to be collected. As such, different uses of data may require different levels of data quality. There are five analytical levels that address various data uses, QA/QC effort, and methods required to achieve the desired level of quality. These

levels are presented in Section 3.0 of the FSP and are specified for surface- and ground-water RI/FS activities for OU III in Table 3-1. A title listing of the levels is as follows

- DQO Level 1 - Screening
- DQO Level 2 - Field Analysis
- DQO Level 3 - Engineering
- DQO Level 4 - Confirmational
- DQO Level 5 - Non-standard

COMMENT 4

P. 2-2, Subsection 2.5; EPA and the State have commented upon the proposed schedule for Surface and Ground Water sampling (see comments above).

RESPONSE:

This Section has been renumbered as Section 2.6. A review has been made to ensure the accuracy of the reference to Section 8.0 of the Work Plan; ". . . Section 8.0 of the WP."

COMMENT 5

P. 3-1, Section 3.0, and Section 3.1; The Region V Model QAPjP suggests a statement (sec 2, page 2, 1st para.) regarding direction of the contractor by the Lead Agency RPM (identified in the FFA as the Project Coordinator) for responsibility of all phases of the RI/FS. That statement, if used, would be appropriate after the first or second paragraph of section 3.1.

RESPONSE:

Section 3.0 has been rewritten to address the ten (10) specific comments [comments five (5) through fourteen (14)] directed to this section of the document. The review comments and information in the Region V Model QAPjP were used as guidance in revising this section. In summary the revised material identifies the EPA Region VIII, State of Utah, and DOE-GJPO responsibilities and associated project organizational structures. Information related to Geotech positions that was fragmented throughout the section has been consolidated where possible. P. 3-8, Section 3.2.8 has been added to address subcontractors to Geotech. The QA Manager responsibilities (Section 3.3.1) have been revised per the guidance provided and as consistent with Geotech internal policy and procedures.

Specific to this comment, Reference P. 3-1, Section 3.1; "The U.S. Department of Energy (DOE) is the lead agency responsible for the remediation of the Monticello Mill Tailings Site (MMTS), Monticello, Utah, which is registered on the National Priorities List. The MMTS

is conducted under the DOE Decontamination and Decommissioning Branch as part of the Monticello Remedial Action Project (MRAP). Activities at the site are controlled by a Federal Facilities Agreement (FFA) entered into by the EPA, the DOE, and the State of Utah (State) on December 1988. The FFA states that activities undertaken pursuant to the agreement are subject to approval by EPA and must be consistent with the requirements of the *Comprehensive Environmental Response, Compensation, and Liability Act* of 1980 (CERCLA), as amended by the *Superfund Amendments and Reauthorization Act* of 1986 (SARA) and the *National Oil and Hazardous Substances Pollution Contingency Plan* (NCP). The EPA positions and determinations are made after consultation with the State, however, EPA retains final decision-making authority for determination including disputes made in the course of executing the FFA.

3.1.1 DOE Management Structure

A brief description of each of the major organizational elements of the DOE project management structure for the OU III, Monticello Mill Tailings Site (also called the Monticello Surface and Ground Water Remedial Action Project (MSGRAP)) is discussed below and is shown in Figure 3-1, DOE Project Management Organization Chart.

The Director, Office of Environmental Restoration and Waste Management, is the approving official who has overall responsibility and authority for the MSGRAP. In fulfilling this responsibility, the Director is designated to approve the total project cost estimate (TPCE), changes to that estimate, to approve the major milestone schedule, and to change project scopes through formal approval of the Project Charter and Project Plan and concurrence with the Project Management Plan. The Director, through the Program Manager, acts as a DOE Headquarters focal point and formal point of contact. The Program Manager for the MSGRAP is the Decontamination and Decommissioning Branch Chief under the Division of Southwestern Area Programs. DOE Headquarters is responsible for formulating DOE policy for the project and reviewing and approving all secondary and primary documents.

The Manager, Albuquerque Field Office (AL), has been delegated the responsibility and authority for the field management of the MSGRAP. This authority has been delegated to the Manager of the Grand Junction Projects Office (GJPO) through the Assistant Manager for Environmental Restoration and Waste Management.

Technical direction and reporting are the responsibility of the Headquarters Program Manager and the GJPO Project Manager. The responsibilities of the GJPO Project Manager are discussed in further detail in the Project Charter. In summary, the Project Manager must establish and implement technical, cost, and schedule baselines and must ensure that project objectives are met in a technically sound and environmentally acceptable manner. The Project Manager must provide for implementation of the DOE's Orders and Policies on

project management, including DOE Order 4700.1, which identifies QA procedures that must be implemented for the Project.

3.1.2 DOE Technical Assistance and Remedial Action Contractor

Geotech, the Operating Contractor to the DOE-GJPO, is the Technical Assistance Contractor (TAC) and Remedial Action Contractor (RAC) for MRAP. Geotech is responsible for assisting the GJPO Project Manager in the implementation of the Project and the execution of the scope of work. Geotech operates as a matrix organization drawing upon the necessary expertise within the various organizations to support the project. Primary accountability for the project is the responsibility of the Program Manager. Geotech's Program Manager establishes overall program scope, cost, and schedule. The Program Manager is supported by the OU III Technical Project Manager in the implementation of the Project.

The Geotech line organizational structure is presented in Figure 3-2. The matrixed relationship of Geotech organizations supporting OU III is provided by example in Figure 3-3. Table 3-1 lists key project personnel for OU III. The various management and quality assurance responsibilities of key project personnel are provided in Section 3.2. The number and type of Geotech personnel on site will vary according to the work schedule.

Table 3-1. Key Project Personnel

Name	Assignment	Organization
Paul Mushovic	Remedial Project Manager	EPA Region VIII
Brent Everett	Utah Project Manager	State of Utah
Tracy Plessinger	Monticello Projects Manager	DOE-GJPO"

COMMENT 6

P. 3-1, third paragraph, first sentence; This statement is confusing because it references the Project Manager and D&D Program Manager before those positions are explained (in the next section). The sentence seems more appropriate for subsection 3.2.2, page 3-3, Technical Project Manager, since it concerns responsibilities of that positions. It is also noted that the "Project Manager" be definition in the National Contingency Plan and as presently identified pursuant to the Federal Facility Agreement is Tracy Plessinger.

RESPONSE:

See response to comment 5 above. Reference P. 3-1, Section 3.1.

COMMENT 7

P. 3-1, third paragraph, second sentence; For the same reason as the above comment, this statement seems more appropriate for Section 3.2.3, P. 3-3.

RESPONSE:

See response to comment 5 above. Reference P. 3-6, Section 3.2.3; The statement "The Field Supervisor is responsible for implementing task required QA/QC measures." was deleted because it was redundant to the information in the referenced section.

"All field sampling personnel will report directly to the Field Supervisor. The Field Supervisor will report directly to the Project Manager and have responsibility for the quality of field data. It is the responsibility of the Field Supervisor to ensure that the FSP, HSP, and applicable portions of the WP and QAPjP are implemented. Field Supervisor responsibilities include

- Verifying that field personnel are qualified and trained for assigned work
- Issuing work assignments to team members
- Conducting daily site status/safety briefings before starting work
- Performing daily QA/QC reviews of field data and notebooks for completeness and accuracy to detect and correct errors in a timely manner
- Ensuring chain-of-custody of collected samples is maintained
- Controlling documents and data, and maintaining project files"

COMMENT 8

P.3-1, fourth paragraph; This paragraph would seem to be more appropriately placed towards the end of Section 3.2.3, P. 3-4.

RESPONSE:

See response to comment 5 above. Section 3.2.8, Subcontractor to Geotech was added, refer to P. 3-8; "All subcontractors employed by Geotech are subject to the QA/QC requirements that are specified in the pertinent Geotech procurement documents. When appropriate, Geotech will require the subcontractor to provide a Quality Assurance Program Plan and, at the direction of the Project Manager, will conduct a pre-award survey to verify QA program implementation."

COMMENT 9

P. 3-1, paragraph 5; This paragraph could be appropriately moved and included in Section 3.2.3, since it relates to that position.

RESPONSE:

See response to comment 5 above. Reference P. 3-6, Section 3.2.3; The first sentence has been moved as suggested, the remainder of the paragraph has been deleted.

"All field sampling personnel will report directly to the Field Supervisor. The Field Supervisor will report directly to the Project Manager and have responsibility for the quality of field data. It is the responsibility of the Field Supervisor to ensure that the FSP, HSP, and applicable portions of the WP and QAPjP are implemented. Field Supervisor responsibilities include...".

COMMENT 10

P. 3-3, section 3.2.1, PROJECT ASSIGNMENT RESPONSIBILITIES; It would appear that the DOE Project Manager/Coordinator should be listed before the D&D Program Manager (3.2.1). The Model QAPjP states that the lead agency project manager "has overall responsibility for all phases of the RI/FS". The Program Manager has overall responsibility for ensuring that the (lead agency) does environmentally sound clean up and the quality standards to attain that objective. The Region V Model QAPjP makes almost the identical statement for the responsibilities of this position.

RESPONSE:

See response to comment 5 above. Reference revised Sections 3.1 and 3.2.

Section 3.2; "Geotech will perform the field investigations and laboratory analysis, prepare the RI report, and perform the subsequent feasibility study. Project management will also be provided by Geotech as described in the following text.

Section 3.2.1; "The Monticello Decontamination and Decommission (D&D) Program Manager (Program Manager) is responsible for establishing scope, schedule, budget, and resources that are needed to achieve project activities and for obtaining sponsor approval and funds for the project. The Program Manager appoints or concurs with the assignment (made by Geotech Section Management) of a Technical Project Manager. The Program Manager is the primary interface with the DOE-GJPO."

COMMENT 11

P. 3-3, Subsection 3.2.2, Technical Project Manager (Project Manager); The Region V Model QAPjP lists this position as "Site/Facility Manager". This may provide a clear distinction between the DOE Project Manager and the "Geotech" designee. The responsibilities of the "Site/Facility Manager include: 1) Implementing the project, 2) Committing resources necessary to meet project objectives and requirements, 3) Ensure technical financial and scheduling objectives are achieved.

RESPONSE:

See response to comment 5 above. Reference revised Sections 3.1 and 3.2.

"The Technical Project Manager (Project Manager) is responsible for the design and execution of all tasks during the project phases. The Project Manager is responsible for managing the RI/FS activities and coordinating the matrixed support of Geotech organizations. The Project Manager reports project status to the Program Manager. The Project Manager has the primary responsibility for project quality control and will assign personnel with responsibilities for routine assessment of measurement systems for precision and accuracy."

COMMENT 12

P. 3-4, Subsection 3.2.5 QA Coordinator, and page 3-5, subsection 3.3.2 Quality Assurance Coordinator; It would be less confusing if subsection 3.2.5 QA Coordinator, was combined with subsection 3.3.2 Quality Assurance Coordinator. The explanation of responsibilities can leave the impression that these are two separate positions.

RESPONSE:

See response to comment 5 above. Revised, refer to P. 3-7, Section 3.2.5; "The QA Coordinator reports functionally to the QA Manager and administratively to the Project Manager. The QA Coordinator will provide management support to the Project Manager and will verify the implementation of QA/QC requirements during project activities. The QA Coordinator will work with all levels of personnel to identify and eliminate the potential for QA problems.

The QA Coordinator is responsible for preparing QA Program/Project Plans at the direction of the Program Manager or designee. The assigned QA Coordinator will be involved during planning in preparing QA Plans, reviewing documents, providing indoctrination when requested, and conducting QA Surveillances to verify compliance with program/project requirements (e.g., monitor field investigations, sample analysis, and data evaluation)."

COMMENT 13

P. 3-5, Section 3.3.1, Quality Assurance Manager; The Quality Assurance Manager will remain independent of direct job involvement and day-to-day operations, and has direct access to corporate executive staff (DOE) as necessary to resolve and QA dispute." Also,

if the QA Manager has direct access to the "corporate executive staff" as defined above, the organization chart on figure 3-1 should indicate the direct access.

RESPONSE:

See response to comment 5 above. Refer to revised portions of P. 3-8 and
3-9, Sections 3.3 and 3.3.1.

"The QA Manager is responsible for the development of the Geotech QA Program to comply with applicable DOE Orders and other sound business practices as established by Geotech Management. The Geotech QA Program is described in the Geotech *Quality Assurance Manual*, Manual 101 (Chem-Nuclear Geotech 1992b). The QA Manager is independent of direct job involvement, and day-to-day project activities and has direct access to Geotech executive staff, as necessary, to resolve any QA dispute. General responsibilities of the QA Manager include, but are not limited, to the following:

- Assure work complies with the QA Program
- Implement an audit program and assure qualification of assigned auditors
- Assign a QA Coordinator to a program or project as a support resource to assist organizations in implementing and complying with Company and customer QA requirements
- Provide technical QA assistance to QA and project staff
- Review and/or approve QA Plans, procedures, and reports in accordance with internal procedures
- Interface on QA matters with the assigned DOE-GJPO Environmental, Safety, Health, and Quality Assurance Director"

COMMENT 14

P. 3-4, Subsection 3.2.8; The Monticello QAPjP provides only two sentences of explanation concerning Laboratory responsibilities (page 3-4, subsection 3.2.8 Laboratory Services Coordinator). EPA believes that this section needs to be expanded. Additional information on laboratory responsibilities may be appropriate for the Monticello QAPjP (e.g., Laboratory Project Manager, Laboratory Operations Manager, Laboratory Quality Assurance Officer and Laboratory Sample Custodian).

RESPONSE:

See response to comment 5 above. Refer to P. 3-8, Section 3.2.7, the text has been slightly modified. DOE-GJPO has been providing analytical services to this project for a number of years. The procedures have been provided to the EPA and the State for their review and concurrence. Given the operating history of this project and the documentation previously submitted, the additional information requested is not appropriate in this document.

"The Laboratory Services Coordinator reports functionally to the Analytical Laboratory Section Manager and administratively to the Project Manager. The Laboratory Services Coordinator provides input to and technical review of project plans, serves as a technical resource to the Field Team, and may assist as an auditor of field and laboratory activities. The Laboratory Services Coordinator is also the primary contact for subcontracted laboratory services. The Laboratory Services Coordinator is responsible for securing laboratory support for analysis of field samples. This includes coordinating internal laboratory operations, such as sample custodian, QA/QC operations, and analytical reports."

"The functions and responsibilities of the Geotech Analytical Laboratory are provided in Section 12 of the Geotech *Management Policies Manual*, Manual 100 (Chem-Nuclear Geotech 1992a). Additional responsibilities and operations of the Geotech Analytical Laboratory are specified in the *Analytical Chemistry Laboratory Handbook of Analytical and Sample-Preparation Methods, Vols. I, II and III* (Chem-Nuclear Geotech 1992c) and the *Analytical Chemistry Laboratory Administrative Plan and Quality Control Procedures* (Chem-Nuclear Geotech 1992d)."

COMMENT 15

P. 4-1, Subsection 4.1, DATA QUALITY, First paragraph; This paragraph discusses data quality objectives (DQOs), but provides little detail. Subsection 4.7 on page 4-9 also discusses DQOs in the first paragraph and references section 3.0 of the Field Sampling Plan which does provide details on DQOs. It is suggested that the paragraph on DQOs in subsection 4.7 be moved and included in the discussion of DQOs in subsection 4.1. This provides the reader with a comprehensive reference for information on DQOs at the beginning of the section on QA Objectives for Measurement, rather than at the end.

RESPONSE:

This section has been revised as suggested, refer to P. 4-1, Section 4.1; "Additional data are needed to confirm the presence of contaminants identified in previous studies and to determine the extent of contamination such that the risk to human health and the environment may be assessed. Data from the baseline sampling effort will be used to determine the constituents of concern for MMTS and to establish an appropriate schedule for future sampling rounds."

"Data quality objectives for accuracy and precision are based on prior knowledge of the measurement system employed, method validation studies using replicates, spikes, standards, calibrations, recovery studies, etc., and the requirements of the specific project."

"Monitoring data were collected and reported in the *Final Remedial Investigation/ Feasibility Study--Environmental Assessment for the Monticello, Utah, Uranium Mill Tailings Site* (UNC Geotech 1990b) and continue to be collected as a function of site compliance monitoring reported annually in the *Monticello Millsite Annual Site Environmental Reports* for calendar years 1979 through 1990 (Bendix

1980; Korte and Thul 1981, 1982, 1983, and 1984; Korte and Wagner 1985 and 1986; Sewell and Spencer 1987; UNC Geotech 1988, 1989, and 1990a; and Chem-Nuclear Geotech 1991a). The primary contaminants identified in the soil and water were heavy metals and radionuclides."

COMMENT 16

P. 4-1, Subsection 4.1, DATA QUALITY, Second paragraph; Two Geotech documents that specify acceptance criteria for laboratory analysis are referenced. Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, (EPA, 1998) indicates that information for the QAPjP may be referenced if the information is included in one of the Work Plan documents. The referenced Geotech documents do not appear to be a part of the Work Plan.

RESPONSE:

The SOPs contained in the referenced manuals have recently been provided to EPA and the State for review. Given the voluminous nature of these documents it is not appropriate to include them in the Work Plan. Review of the previous submitted documents should meet the intent of the *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, (EPA, 1998)* and be consistent with the guidance provided in the EPA Region V Model QAPjP.

COMMENT 17

P. 4-8, Subsection 4.3, PRECISION, Paragraph 2; The precision of temperature measurements should agree within two (2) degrees Celsius.

RESPONSE:

P. 4-8, Section 4.3, paragraph 2; the last two sentences have been revised to read "The precision and accuracy of pH measurements are ± 0.3 pH units. The precision and accuracy of conductivity (Ec) measurements are ± 10 percent. The precision of temperature measurements should agree within two degrees Celsius."

COMMENT 18

P. 7-1, Subsection 7.3, SUBCONTRACTED LABORATORY; EPA recommends that records of calibration be submitted to Geotech. This will ensure there availability should a subcontractor lab go out of business.

RESPONSE:

P. 7-1, Section 7.3 has been revised to more clearly specify the receipt of calibration records as part of the analytical data package. "Calibration records shall be submitted to Geotech as part of the Analytical Data package. Copies of calibration records of subcontracted laboratories will be filed and maintained at the respective laboratory where the work is performed."

Additionally, P. 9-2, Sections 9.2; has been revised to read "• All raw data and supporting documentation (including calibration data)" and 9.3 have been revised to read "The contents should address the data report item listed in Section 9.2 above, as appropriate."

COMMENT 19

P.8-1, Subsection 8.1, ANALYTICAL PROCEDURES; There should be a mechanism built in that will notify DOE, EPA and the State of any changes in analytical procedures.

RESPONSE:

P. 8-1, Section 8.1, paragraph 2; has been prepared to describe the mechanism and to assign responsibility for evaluation and notification of changes to analytical procedures; "The Program Manager will ensure that the DOE is notified of any substantive changes to these project documents or the procedures that are specified."

Additionally, a sentence has been added to P. 3-6, Section 3.2.1. to address the comment; "The Project Manager will evaluate the significance of any changes to the laboratory procedures that might pertain to the analysis of OU III samples. The Project Manager will notify the Program Manager when changes should be brought to the attention of the DOE, EPA, and the State."

P. 8-3, SUBCONTRACTED LABORATORY, a second paragraph has been added to address the comment as it might relate to subcontracted laboratory services; "Subcontracted laboratories will be required to notify Geotech and obtain Geotech authorization for changes to analytical procedures as specified in the procurement documents. Geotech authorization must be obtained prior to the subcontractor performing the analysis affected by the change."

NOTE: P. 8-1 and 8-2, Section 8.1; a thorough review of the procedures presented in this section was conducted to determine if changes have occurred since this document was initially prepared (February 1992). Any changes have been incorporated into this section as well as Tables 4-1 and 5-1 where appropriate.

COMMENT 20

P. 8-1, VOC Analyses; DOE should specify that sample clean-up procedures organic methods, if necessary, will follow SW 846 or will be comparable.

RESPONSE:

P. 8-1 and P. 8-2, revisions have been made under VOC analyses, semiVOC analyses, pesticide/PCB analyses, and herbicide analyses to address the comment.

"VOC analyses . . . . Sample clean-up procedures for organic methods, if necessary, will follow *Test Methods for Evaluating Solid Waste* (SW-846) (USEPA 1986) or will be comparable."

"SemiVOC analyses . . . . Sample clean-up procedures for organic methods, if necessary, will follow SW-846 or will be comparable."

"Pesticide and PCB analyses . . . . Sample clean-up procedures for organic methods, if necessary, will follow SW-846 or will be comparable."

"Herbicide analyses . . . . Sample clean-up procedures for organic methods, if necessary, will follow SW-846 or will be comparable."

COMMENT 21

When DOE mentions under VOC and Semi VOC analyses that it will identify and semiquantify the next 10 or 15 peaks, is DOE referring to Tentatively Identified Compounds? Please Explain.

RESPONSE:

P. 8-1 under VOC analyses and semiVOC analyses, Geotech is referring to Tentatively Identified Compounds. The text under each of these headings has been revised to address the comment.

"VOC analyses . . . . For each sample analysis, the laboratory will conduct a mass spectral library search to determine Tentative Compound Identification of the ten nonsurrogate VOCs of greatest concentration, which are not listed in Table 4-1."

"SemiVOC analyses . . . . For each sample analysis, the laboratory will conduct a mass spectral library search to determine Tentative Compound Identification of the twenty nonsurrogate semiVOCs of greatest concentration, which are not listed in Table 4-1."

COMMENT 22

P.8-1, Subsection TCL Metals....; If DOE is planning to digest dissolved metals it should be specified.

RESPONSE:

P. 8-2, Section TCL Metals...; the text has been revised to clarify the analysis of unfiltered samples; ". . . will be performed on unfiltered samples . . . ."

COMMENT 23

P. 8-2, Subsection Radionuclide Analyses; Please clarify, are methods C-5, C-7, and RC-2 water or soil methods or both?

RESPONSE:

P. 8-2, under the heading Radionuclide Analyses; Only surface- and ground-water samples are being obtained for laboratory analysis through this phase of the remedial investigation, therefore, analytical procedures specific to soil have not been specified.

COMMENT 24

P. 9-2, Section 9.2, DATA REPORTS; Please specify that both Geotech and Sub-contractor labs will provide listed data. Also include as a bullet, "All raw data and supporting documentation".

RESPONSE:

P. 9-2, Section 9.2; a ninth bullet has been added to the laboratory data report information to address this comment, "● All raw data and supporting documentation (including calibration data)". Additionally, P. 9-2, Section 9.3 has been revised; "The contents should address the data report item listed in Section 9.2 above, as appropriate."

COMMENT 25

P.10-1, Subsection 10.1.1 Duplicates; Please specify that duplicates will be sent blind to the lab.

RESPONSE:

P. 10-1, Section 10.1.1 has been revised as suggested; "Field duplicates will be uniquely identified in a manner consistent with the project sample numbering scheme (refer to Section 6.1 of the FSP) and will be sent blind to the laboratory."

Additionally, P. 4-2, Section 4.3 has been revised to address the comment; ". . . and will be submitted blind to the laboratory."

COMMENT 26

P. 10-2, Subsection 10.2.1. Quality Control Batching; Does DOE mean one duplicate (replicate) field or lab sample?

RESPONSE:

P. 10-2, Section 10.2.1; refers to Laboratory selected duplicate. This sentence has been revised to read ". . . lab sample."

COMMENT 27

P. 10-2, Subsection 10.2.3 Blanks and Matrix Spikes; Add a description of check standards and duplicates.

RESPONSE:

P. 10-2, Section 10.2.3 has been revised to read "Method blanks and matrix spikes and/or matrix duplicates will be analyzed with every analytical batch as appropriate to the method."

COMMENT 28

P. 10-2 Section 10.4 SUBCONTRACTED LABORATORY; Same as comment 10.2.3. above.

RESPONSE:

P. 10-2, Section 10.4; has been rewritten to address the comment and to conform with the information provided in Sections 10.2.1, 10.2.2, and 10.2.3.

"For subcontracted analyses, internal quality control will be performed according to approved procedures. The requirements as specified above in Subsections 10.2.1, *Quality Control Batching* 10.2.2, *Standards and Surrogates* and 10.2.3, *Blank and Matrix Spikes*, will be specified in the procurement documents."

Other changes:

P. 6-1, Section 6.2, paragraph 1, last sentence; has been reworded to read "When necessary, clear tape will be placed over each sample label for protection." The option not to use clear tape if vinyl labels are used has been removed. Recent sampling experience with the vinyl labels has shown that clear tape is necessary to protect the label and maintain adhesion when the sample container is immersed in the water bath (after collection and during transportation)."

P. 12-1, Section 12.0; text has been added and Sections 12.1, FIELD EQUIPMENT/INSTRUMENTS and 12.2, LABORATORY EQUIPMENT/ INSTRUMENTS have been developed per the guidance provided in the EPA Region V Model QAPjP.

Section 12.1; "Field equipment for this project includes, but not limited to, thermometers, pH meters, conductivity meters, Eh meters, DO meters, and NTU meters. Specific preventive maintenance procedures to be followed for field equipment are those recommended by the manufacturer."

"Field instruments will be visually inspected and operationally checked before being shipped or carried into the field. Calibration checks will be performed in accordance with SOPs (see Appendix A of the FSP)."

"Critical spare parts and supplies, such as tape, bottles, filters, tubing, probes, electrodes, and batteries will be kept on-site to minimize instrument down time. Back-up instruments and equipment

will be available on-site or within one-day shipment to avoid delays in the field schedule."

Section 12.2; "The laboratory will maintain a maintenance schedule for servicing critical items to minimize the downtime of measurement systems and to arrange for service as required."